

NEW RECORDS AND DESCRIPTIONS OF TIDAL AND SUBTIDAL SYLLID SPECIES (POLYCHAETA) FROM THE CHINESE COAST

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ABSTRACT

This list of six species of Syllidae is another contribution to the study of littoral meiofaunal polychaetes from the Chinese coast, of which the syllids comprise most of the species. They were sampled in the north near Yantai and in the south of China at various places on the Island of Hainan. *Petitia amphophthalma* Siewing, 1956 and *Pionosyllis homocirrata* (Hartmann-Schröder, 1958) are representatives of the many interstitial polychaete species settling worldwide in exposed sand beaches. *Psammosyllis wui*, *Odontosyllis rubens*, *Pionosyllis corallicola* and *Syllides sanyaensis* are new to science.

For several years there has been a close collaboration between the First Institute of Oceanography in Qingdao (People's Republic of China) and the Systematic Zoology Department of the University of Osnabrück (Federal Republic of Germany) with the aim of surveying the littoral meiofaunal polychaetes of the Chinese coast. So far three expeditions have been made (in the region of Dalian, Yantai and Qingdao in the north, in the vicinity of Xiamen in the Strait of Taiwan, and on the island Hainan in the south) to collect specimens in intertidal and shallow subtidal coastal areas. Some of these findings have already been published (Zhao and Wu, 1991a, 1991b; Wu and Zhao, 1992; Wu et al., 1994; Ding and Westheide, 1994; Westheide et al., 1994; Licher et al., 1994). The results are to be integrated into an ongoing worldwide taxonomic and zoogeographic investigation of meiofaunal polychaetes in littoral areas by the senior author.

METHODS

With the exception of the *Odontosyllis* species, animals were extracted from small samples of sand by the $MgCl_2$ method (Westheide, 1990b), then sorted and inspected using a dissecting microscope in provisional laboratories near the different sampling sites. Fixation was either in Bouin's fluid or 10% formalin. Determination took place in the laboratory of the senior author in Osnabrück, where line drawings were made with a camera lucida.

Psammosyllis wui new species Figure 1A–H

Material Examined.—Two complete specimens from subtidal sand patches in a dead coral reef near Meixia, Xinying (19°54'N, 109°31'E), South China Sea, Hainan Island; 11 Oct 1991: locus typicus.

Type Material.—Holotype: complete specimen with 16 chaetigers, 1.7 mm long (not including palps and anal cirri); deposited in Senckenberg Museum, Frankfurt am Main (SMF 5333). One paratype in the collection of the First Institute of Oceanography, Qingdao (FIOQ 1001).

Description.—Almost transparent, no color markings, with exception of the conspicuously brown pharynx. Length between 1.7 mm (16 chaetigers) and 2.0 mm (18 chaetigers); width 210–220 μm without parapodia at level of proventricle, 450–480 μm wide including dorsal cirri. Body slender, narrowing anteriorly and posteriorly. Dorsal side convex, ventrally flattened.

Prostomium rounded anteriorly, posteriorly not distinctly separated from the tentacular segment. Palps large, tapering, completely fused dorsally except for a small anterior notch (Fig. 1A), median ventral furrow more distinct. Two pairs of eyes, in anteriorly open trapezoidal arrangement, with lenses; the anterior ones slightly

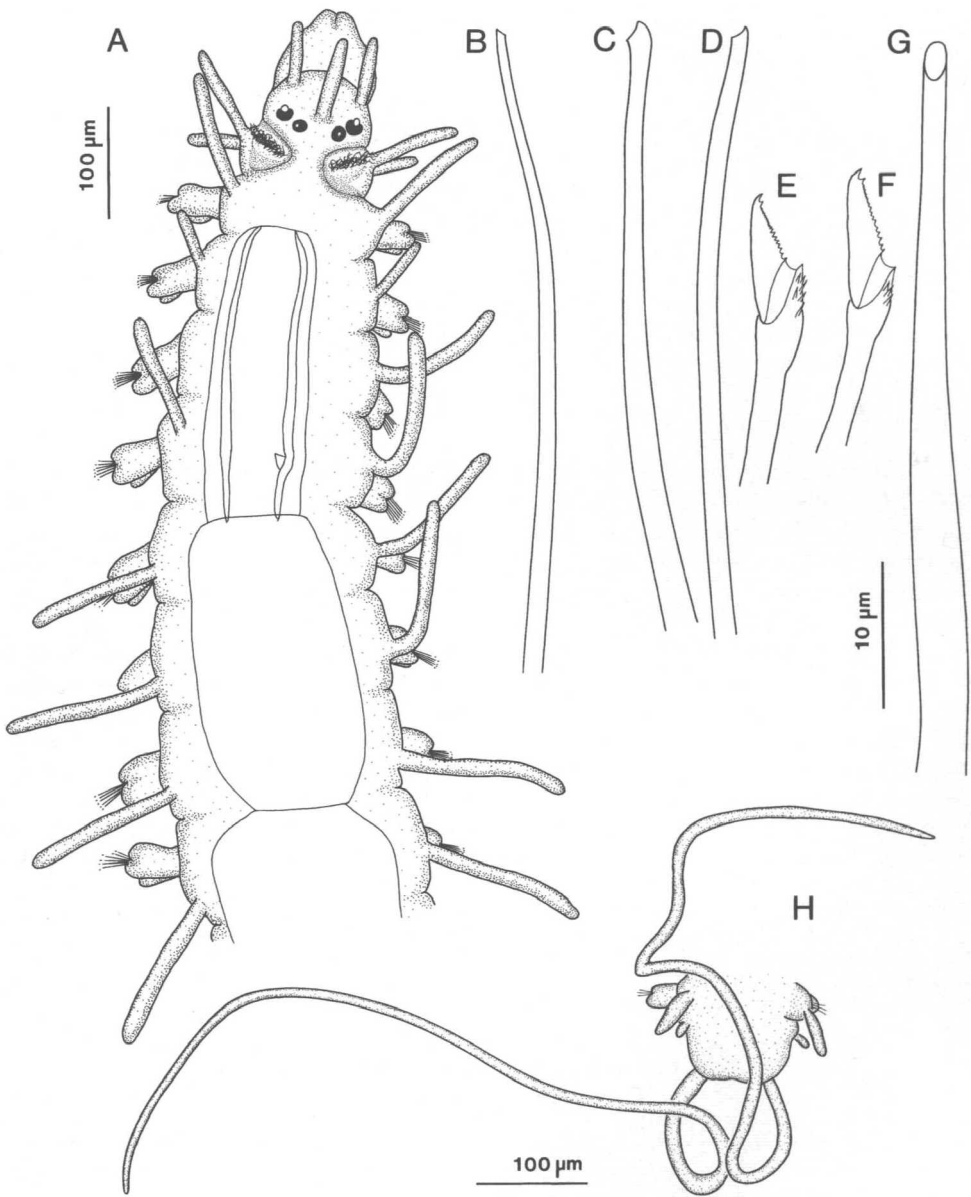


Figure 1. *Psammosyllis wui* new species. A. Anterior end, dorsal view. B. Sub-acicular simple chaeta, chaetiger 11. C. Sub-acicular simple chaeta, chaetiger 18. D. Supra-acicular simple chaeta, chaetiger 7. E. Ventralmost falciger, chaetiger 7. F. Dorsalmost falciger, chaetiger 7. G. Acicula, chaetiger 7. H. Posterior end, dorsal view.

larger. Three smooth, digitiform antennae of almost identical length; the median one (ca. 67 μm) posterior to the lateral ones (ca. 60 μm). Two pairs of tentacular cirri: slender, digitiform, dorsal pair longer (ca. 73 μm) than the ventral pair (ca. 50 μm).

Parapodia uniramous (Fig. 1A) with smooth dorsal cirrus extending from short cirrophores far beyond the parapodial lobes, cirri bearing gland-like structures distally; length of cirri increasing from chaetiger 2 (ca. 113 μm) to the mid-body

region (ca. 150 μm). Considerable distance between dorsal cirrus and neuropodium; distal part of neuropodia with two thick labia, between which the chaetae emerge. Prominent tongue-like ventral cirrus not exceeding length of neuropodia. One thick acicula present in each parapodium, bluntly tipped (Fig. 1G). Sub-acicular chaetal bundle containing about 9 to 12 falcigerous compound chaetae of subequal length with short bifid blades (ca. 9 μm), cutting edges finely serrated, distal parts of shafts slightly serrated (Figs. 1E, F). Superiormost in the bundle one somewhat bifid simple chaeta (Fig. 1D); one additional simple chaeta, inferiorly positioned in about the last seven segments (Fig. 1B, C). Decreasing size of dorsal cirri and smaller number of chaetae in the posteriormost chaetigers, last segment achaetous.

Pygidium somewhat rectangular, laterally bearing paired filiform anal cirri, about 870 μm long (Fig. 1H).

Length ratio of pharynx to proventricle about 1:1 (Fig. 1A). Pharynx cylindrical, opening smooth; stout falciform tooth in a conspicuous depression of posterior third of pharyngeal wall. Proventricle (ca. 270 μm long) situated from anterior part of chaetiger 5 to anterior margin of chaetiger 8, with about 42 muscular rows.

Etymology.—The species is named after Professor Wu Baoling from Qingdao, whose work has added so much to the knowledge of the Chinese polychaete fauna.

Remarks.—The present specimens belong to the hitherto monotypic genus *Psammosyllis* Westheide, 1990. They agree well with *P. aliceae* from South India (Westheide, 1990a), in possessing the voluminous pharynx-proventriculus with its characteristic lateral position of a stout tooth in the posterior part of the proventricle, in shape and position of the dorsal cirri, and in its general chaetation pattern. Differences, however, are obvious especially in the fused palps which are considerably shorter than in *P. aliceae* and which still show a distinct, median terminal notch between them. The nuchal organs appear to be more prominent, but this may be due to differences in fixation. Furthermore, there is only one thick acicula in the parapodia, probably also the thin acicula is lacking; the number of falcigers in the chaetal bundles is about half that of the Indian species; also the tips of the simple chaetae appear to be differently shaped, although this is difficult to discern.

Odontosyllis rubens new species

Figures 2A–M, 3A–C

Material Examined.—Nineteen specimens, 17 of which complete, between crusts of the bryozoan *Phidolopora pacifica* (Robertson, 1905) (Cheilostomata), from intertidal rocks around the Qingdao pier: Qingdao, Yellow Sea (April and October, 1992).

Type Material.—Holotype: complete specimen, with 42 chaetigers; deposited in Senckenberg Museum, Frankfurt am Main (SMF 5334); 2 paratypes (SMF 5335); remaining specimens in the collection of First Institute of Oceanography, Qingdao (FIOQ 1002).

Description.—Body with dark red color which they share with the bryozoan colonies on which they were exclusively found. Color does not fade in alcohol. Dorso-ventrally flattened. Length between 2.0 and 6.2 mm (not including palps and anal cirri), with 23 to 42 chaetigers. Width about 0.45 to 0.7 mm (without parapodia) at the level of proventricle.

Prostomium anteriorly rounded, bilobed posteriorly (Figs. 2A, 2B), with ciliary patches laterally and posteriorly; with three pairs of dark red eyes, in hexagonal arrangement, anterior ones small, without lenses, near lateral antennae; posterior

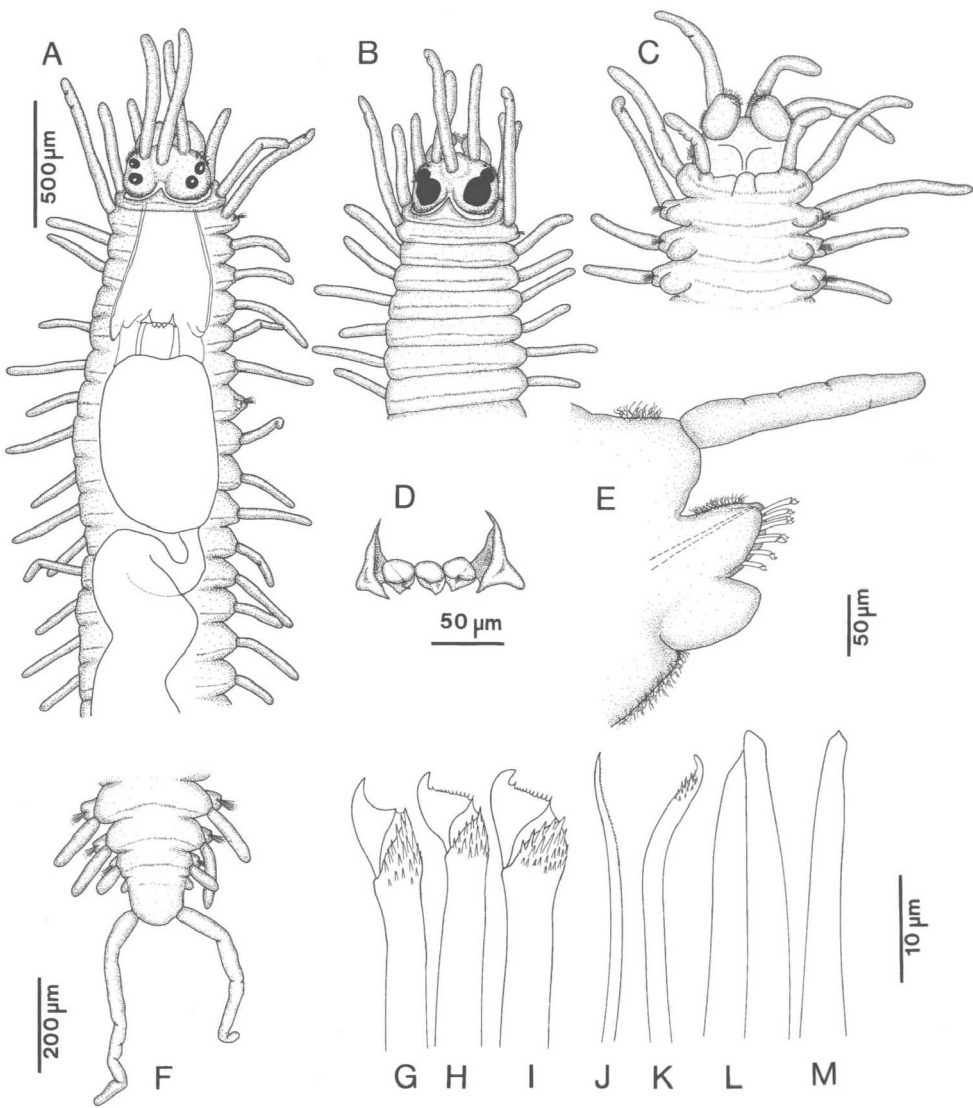


Figure 2. *Odontosyllis rubens* new species. A. Anterior end, dorsal view. B. Anterior end, dorsal view, epitokous specimen. C. Anterior end, ventral view. D. Teeth of pharynx. E. Parapodium of chaetiger 24. F. Posterior end, dorsal view G. Compound chaeta of chaetiger 8. H. Compound chaeta of chaetiger 17. I. Compound chaeta of chaetiger 24. J. Superior simple chaeta of chaetiger 38. K. Inferior simple chaeta of chaetiger 38. L. Aciculae of chaetiger 8. M. Acicula of chaetiger 24.

ones larger, subequal, with lenses. Median antenna long (ca. 560 μm), inserted in the middle of prostomium, at level of the median pair of eyes. Two paired lateral antennae, slightly shorter (ca. 490 μm) than median one, inserted near anterior margin of prostomium. Palps stout, sub-quadrangular, shorter than prostomium, free to the base, with cilia at the tip (Figs. 2A, 2B, 2C). Nuchal organs crescent-shaped ciliated grooves at the boundary between prostomium and tentacular segment. Tentacular segment somewhat triangular dorsally; with two pairs of tentacular cirri, dorsal ones slightly longer (ca. 370 μm) than ventral ones (ca. 310 μm).

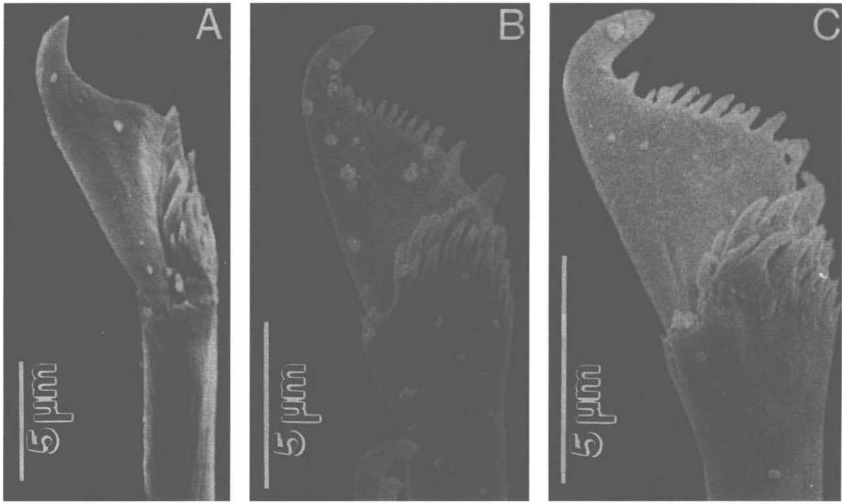


Figure 3. *Odontosyllis rubens* new species. REM-micrographs. A. Compound chaeta from an anterior chaetiger. B. Compound chaeta from a median chaetiger. C. Compound chaeta from a posterior chaetiger.

Each segment with a ring of cilia, interrupted by the parapodia (Figs. 2A, 2B, 2C). Parapodia short and uniramous (Fig. 2E). Dorsal cirri with slightly irregular wrinkles; cirri on chaetiger 1 relatively long (ca. 560 μm), almost same length as median antenna. Following segments with shorter cirri, alternating in length: the longer ones (ca. 320 μm) usually about equal to half of body width, shorter ones about 270 μm long. Ventral cirri auricular, not extending beyond the parapodial lobes (Figs. 2C, 2E). Parapodia consisting of two prominent blunt lobes between which the chaetae emerge; anterior lobe slightly shorter and smaller than the posterior one (Fig. 2E). Tuft of cilia at the base of the dorsal cirri, and another tuft of cilia on dorsal side of parapodial lobes. Two aciculae in anterior and mid-body parapodia (Fig. 2L), one acicula in the posterior segments (Figs. 2E, 2M); aciculae with pointed tips. Subacicularly 8 to 12 falcigers, with short, sharply hooked blades (10 μm long). Falcigers with smooth cutting edge in anterior parapodia (Fig. 2G, Fig. 3A); with 8 to 11 fine serrations and a very small accessory subdistal tooth in mid-body and posterior parapodia (Figs. 2H, 2I; 3B, 3C). Fimbriated sheath connecting blade to shaft-head, shafts distally serrated (Figs. 2G, 2H, 2I). One superior simple and one inferior simple chaeta, restricted to the 4 to 6 posteriormost chaetigers. Superior simple chaetae slightly curved and with fine subdistal serrations on the cutting edge (Fig. 2J); inferior simple chaetae thinner than falcigers but thicker than superior simple chaetae, strongly curved and subdistally serrated (Fig. 2K). Decreasing number of chaetae in the posteriormost parapodia, last segment achaetous.

Pygidium semi-rounded. Two elongate anal cirri, about 500 μm long (Fig. 2F).

Pharynx short, with three backward pointed median teeth and two pointed triangular lateral teeth arranged in a ventral arc of the anterior margin (Figs. 2A, 2D). Proventricle extending from the anterior margin of chaetiger 6 to the middle of chaetiger 11, about 720 μm long, with about 40 closely packed muscle cell rows.

Specimens collected on April 1, 1992 mature with epitokous characters: considerably large and dark eyes, the posterior pair of which much larger than the anterior one; gametes (spermatocytes, sperm?) in the mid-body segments.

Etymology.—The species name refers to its intense red color.

Remarks.—*Odontosyllis rubens* new species is distinguished from all previously described species of the genus *Odontosyllis* Claparède, 1863 by the unique combination of red color not fading in alcohol, a pharynx with three backwards directed teeth and two pointed triangular lateral teeth in a ventrally positioned arc, parapodia with relatively long dorsal cirri, falcigers with short blades in anterior chaetigers, and two aciculae in the anterior and mid-body parapodia. *Odontosyllis rubens* new species probably is most closely related to the *O. detecta* Augener, 1913 from Japan (Imajima, 1966) which also has a reddish color, a prostomium not covered with an occipital flap and short composite falcigers. In *O. detecta*, however, the reddish body color disappears in alcohol, it possesses only four eyes and up to four aciculae are present in the anterior parapodia. The falcigers of *O. detecta* have minute serrations throughout the body; its pharynx is equipped with four pointed median teeth and the lateral teeth are distally rounded. In *O. detecta* specimens described from Cuba (San Martín, 1990) the red pigment occurs in the prostomium only, falcigers have serrations throughout the body, and the pharynx possesses five pointed teeth and no triangular lateral teeth are present.

Since most of the syllids are carnivores, feeding on hydroids, bryozoans, and other small colonial invertebrates (Fauchald and Jumars, 1979) it is assumed that the red color of the new *Odontosyllis* species is produced by incorporation of the red pigment of the bryozoan *Phidolopora pacifica* on which it may graze exclusively.

Petitia amphophthalma Siewing, 1956

Figure 4

Material Examined.—(1) Sixteen specimens from Shushan Dao Beach, Shandong Province, Yantai (Sept. 1987). (2) Four specimens from Jiefang Beach, Shandong Province, Yantai, and Xuing Beach near Haikou, Hainan Island, South China Sea (20°01'N, 110°16'E) (Oct. 1991). Specimens deposited in the collection of the authors.

Description.—Complete specimens about 0.85–0.95 mm long, not including palps and anal cirri; 70–95 μm wide at level of proventricle without parapodia, 250–340 μm wide with parapodia including dorsal cirri; with 18–20 chaetigers.

Prostomium almost straight cut anteriorly, and slightly convex posteriorly. Three antennae, inserted near the anterior margin of the prostomium. Lateral antennae cirriform, about 157 μm long, the median one usually broken. Two large palps biarticulated, longer than the prostomium, free to the base. Distal part of palps shorter and smaller than basal one. Peristomium with two pairs of tentacular cirri, the dorsal pair longer (ca. 190 μm) than the ventral pair (ca. 110 μm).

Parapodia uniramous, bluntly conical, their length more than half of the body width. Dorsal cirri on the chaetiger 1 cirriform, about 200 μm long, about the same size as dorsal tentacular cirri. Dorsal cirri on chaetiger 2 and backwards much shorter, digitiform, about 30 μm long. Ventral cirri arising subdistally from the parapodial lobe, extending the parapodial lobe. Bundles of chaetae with a single supra-acicular simple chaeta, slightly curved and tapering, in all parapodia, with about 4–6 conspicuous serrations subdistally on concave side (Figs. 4F, 4I). Sub-acicularly, 5 to 7 heterogomph bifid compound chaetae with blades distinctly serrated proximally and in the middle part, subdistal serrations hardly recognizable. Length of blades of compound chaetae decreasing from dorsalmost to ventralmost position, e.g., in chaetiger 6 from about 35 μm (Fig. 4A) to about 12 μm (Fig. 4D), length ratio nearly 3:1. Maximum length of the dorsalmost compound chaetae 35 μm in the median parapodia (Fig. 4A), decreasing in length to the

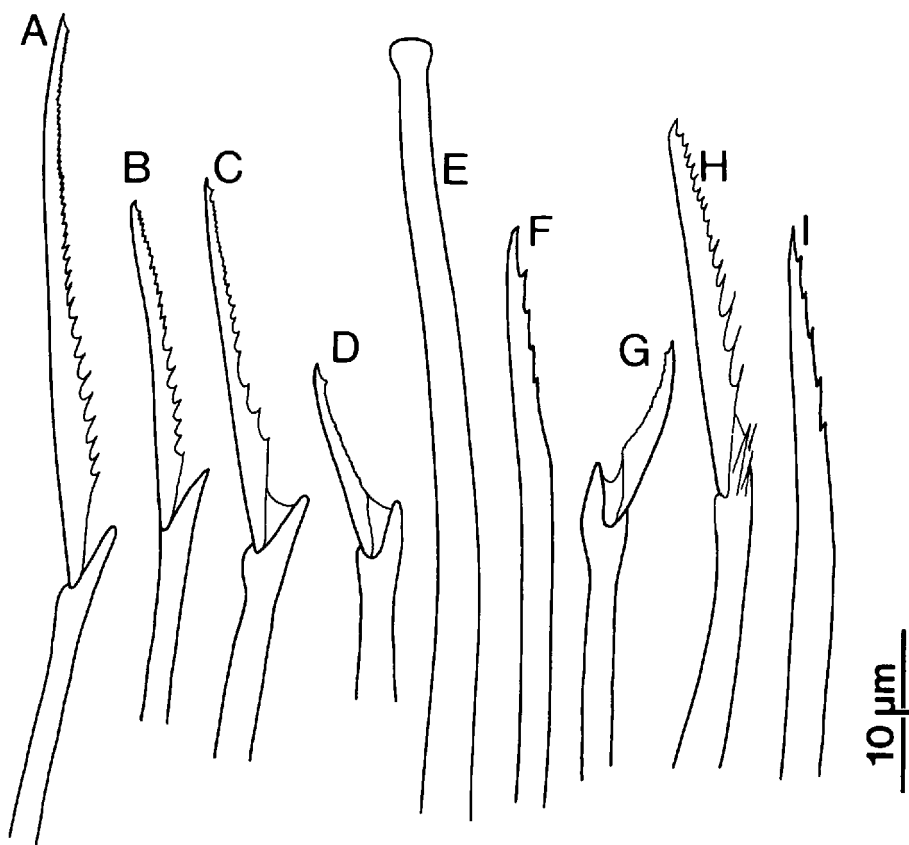


Figure 4. *Petitia amphophthalma* Siewing, 1956. Chaetae. A. Uppermost falciger, chaetiger 6. B, C. Falcigers in the middle of the bundle, chaetiger 6. D. Inferiormost falciger, chaetiger 6. E. Acicula, chaetiger 12. F. Supra-acicular simple chaeta, chaetiger 12. G. Inferiormost falciger, chaetiger 10. H. Dorsalmost falciger, chaetiger 10. I. Supra-acicular simple chaeta, chaetiger 10.

anterior (ca. 20 μm in chaetiger 1) and posterior parapodia (Fig. 4H) (ca. 18 μm in the posteriormost chaetiger). The ventralmost compound chaetae sub-equal (Figs. 4D, 4G), about 9 to 12 μm . All chaetigerous lobes with one acicula possessing a knobbed tip (Fig. 4E).

Pygidium with one pair of lateral and one median ventral anal cirrus.

Pharynx (ca. 110 μm) extending from tentacular segment to posterior part of chaetiger 2. Margin of pharyngeal opening smooth; large pharyngeal tooth sub-distally with the apex not reaching margin of opening. Proventriculus (ca. 80 μm long) situated between posterior part of chaetiger 2 and anterior part of chaetiger 4, with about 15 transverse rows of muscle cells.

Remarks.—*Petitia amphophthalma* is one of the typical interstitial polychaete species occurring worldwide in exposed sandy beaches (Westheide, 1977: Fig 1B). The present Chinese specimens cannot be distinguished morphologically from those of other geographically very distant localities; they agree well, e.g., with individuals from the Mediterranean (Westheide, 1972), and from Brazil (Westheide, 1974a).

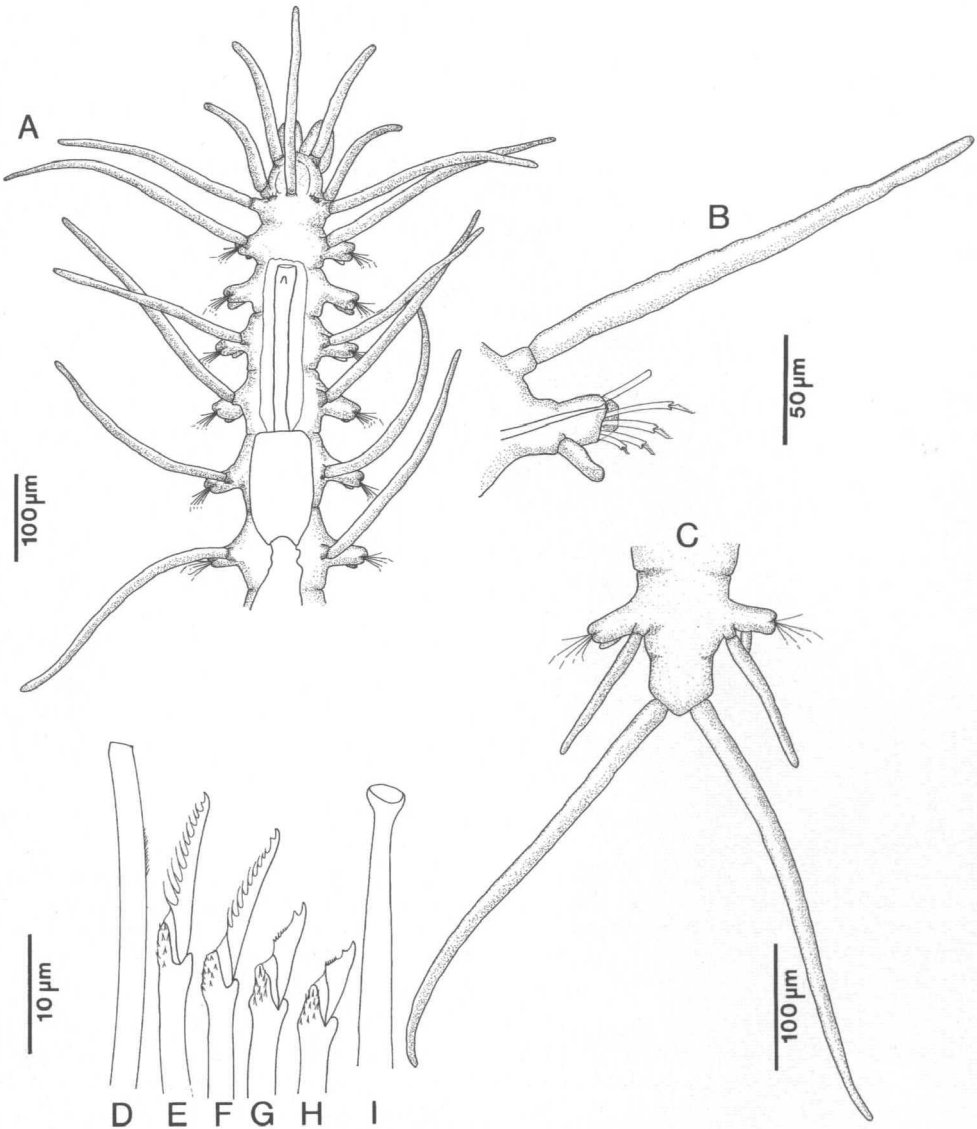


Figure 5. *Pionosyllis homocirrata* (Hartmann-Schröder, 1958). A. Anterior end, dorsal view. B. Parapodium of chaetiger 15. C. Posterior end, dorsal view. D–I. Chaetae of chaetiger 4. D. Supra-acicular simple chaeta. E, F. Uppermost falcigers. G, H. Inferiormost falcigers. I. Acicula.

Pionosyllis homocirrata (Hartmann-Schröder, 1958)

Figure 5A–I

Material Examined.—Seven complete specimens. Hainan Island, South China Sea. Intertidal beach slope with very coarse coral sand near Sanya (18°14'N, 109°30'E), Oct. 20, 1991. Specimens were compared with paratypes. Deposited in the collection of the authors.

Description.—Prostomium (Fig. 5A) rounded anteriorly. Eyes absent. Palps large, oval. Three smooth antennae, cirriform with ceratophores; median one longest (ca. 330 μm), about three times as long as prostomium, arising from posterior margin of prostomium. Two paired lateral ones (ca. 160 μm) about one-third shorter than median one, inserted in anterior margin of prostomium. Nuchal organs one pair

of ciliated ridges between the prostomium and tentacular segment. Tentacular segment with two pairs of tentacular cirri, cirriform, with cirrophores, dorsal ones (ca. 260 μm) longer than the ventral ones (ca. 135 μm).

Parapodia (Fig. 5B) uniramous and relatively long. Dorsal cirri smooth, cirriform, with cirrophores. Dorsal cirri on chaetiger 1 long (ca. 320 μm). Dorsal cirri on the following chaetigers about 310 μm long, slightly shorter than on chaetiger 1. Ventral cirri digitiform, arising from the middle of the parapodial lobe, usually not extending beyond the parapodial lobe. Chaetae emerging between two lobes, the posterior one slightly shorter and smaller. Acicula (Fig. 5I) distally knobbed. Chaetal bundle with single supra-acicular simple chaeta, slightly curved, with very fine hair-like serrations on the convex side, with straight cut tip (Fig. 5D). Sub-acicularly 4 to 5 bidentate composite falcigers, the 2 uppermost compound chaetae with long blades (ca. 15 μm), with thin, forward-bending long serrations on the cutting edge (Figs. 5E, 5F), the 2 lowermost chaetae with shorter blades (8–9.5 μm), with fine serrations on the cutting edge (Figs. 5G, 5H). Distal part of composite falcigers with fine serrations.

Pygidium triangular (Fig. 5C). Two paired anal cirri, cirriform (ca. 164 μm long).

Pharynx (ca. 135 μm long) straight, extending from the posterior margin of chaetiger 1 to the posterior margin of chaetiger 4. The anterior margin smooth, with one median dorsal subdistal tooth.

Proventricle with 15 wide and 4 narrow rows of muscle cells; situated from posterior margin of chaetiger 4 to middle of chaetiger 6.

Three female specimens with 2–4 eggs in chaetigers 12 and 13. Two male specimens with two pairs of seminal vesicles, funnel and sperm ducts in chaetigers 12, 13 and 14.

Remarks.—Five *Pionosyllis* species have been described lacking eyes: *P. anops* Hartman, 1953, *P. longisetosa* Hartmann-Schröder, 1965, *P. gorringensis* Hartmann-Schröder, 1977, *P. spinisetosa* San Martin, 1990, and *P. anophthalma* Capaccioni and San Martin, 1990.

To this list *Eusyllis homocirrata* Hartmann-Schröder, 1958 has to be added because of its smooth anterior pharyngeal margin, which is characteristic for *Pionosyllis* Malmgren, 1867 (San Martin, 1990). The present Chinese specimens agree well with the description of the latter species from the Bahamas and Cuba (Hartmann-Schröder, 1958) and especially with specimens of this species from the Galapagos (Westheide, 1974b, Fig. 32). *Pionosyllis homocirrata* (Hartmann-Schröder, 1958) is one of the typical interstitial polychaetes which have a worldwide distribution in exposed intertidal tropical beaches (Westheide, 1977: fig. 1B).

Pionosyllis corallicola new species

Figure 6A–J

Material Examined.—Hainan Island, South China Sea. (1) 23 specimens from subtidal patches of sand between coral reefs, 2 to 3 m deep, near Sanya (18°14'N, 109°30'E), Oct. 18, 1991: locus typicus. (2) 1 specimen from an intertidal beach with coral sand, near Meixia (19°54'N, 109°31'E), Oct. 11, 1991.

Type Material.—Holotype: complete specimen with 34 chaetigers; deposited in Senckenberg Museum, Frankfurt am Main (SMF 5337); 4 paratypes (SMF 5338); remaining specimens in the collection of the First Institute of Oceanography, Qingdao (FIOQ 1003).

Description.—Maximum length 3.0 mm (not including palps and anal cirri); 340 μm wide with parapodia (which have shorter dorsal cirri), 240 μm wide without parapodia, 120 μm wide in the interparapodia region. Maximum number of chaetigers 34. Prostomium (Figs. 6A, 6B) anteriorly rounded, with one pair of ciliary

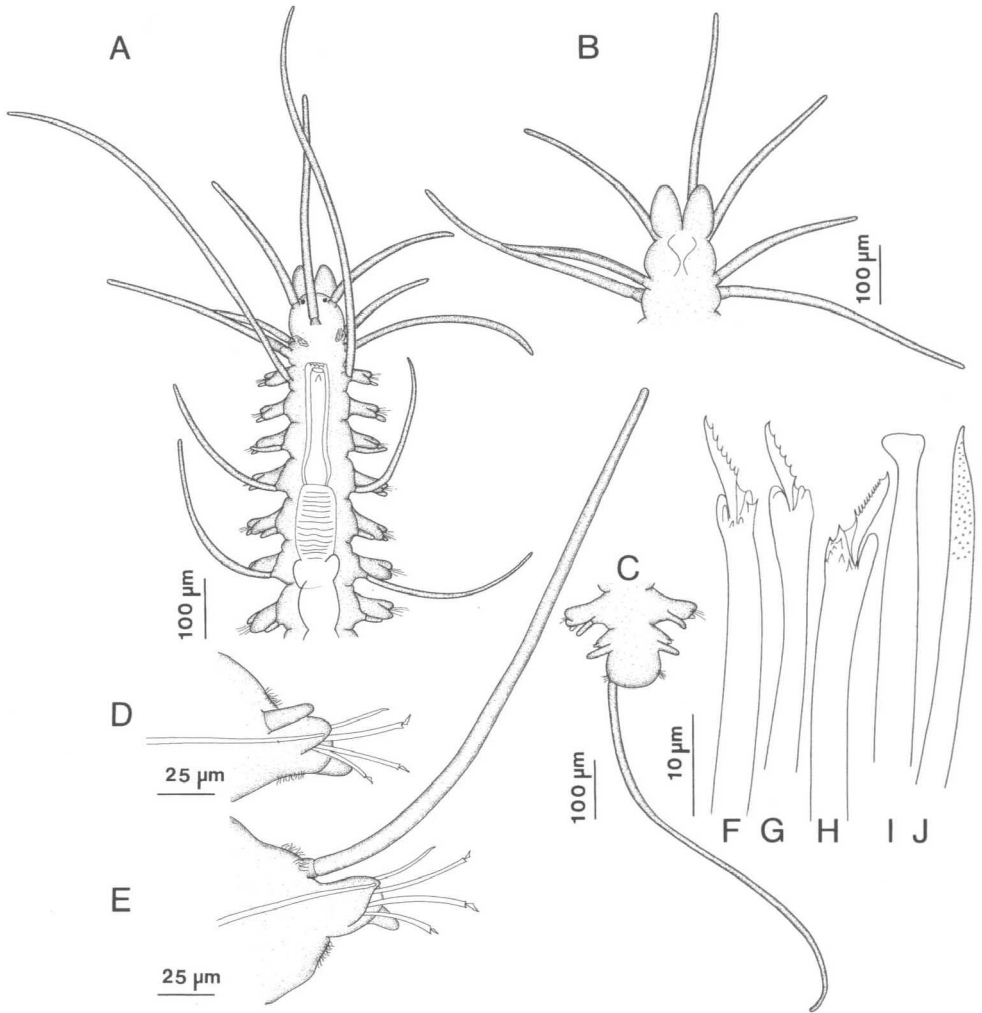


Figure 6. *Pionosyllis corallicola* new species. A. Anterior end, dorsal view. B. Anterior end, ventral view. C. Posterior end, dorsal view. D. Parapodium of chaetiger 18, anterior view. E. Parapodium of chaetiger 19, anterior view. F. Falciger in the middle of the bundle, chaetiger 17. G. Inferiormost falciger of chaetiger 17. H. Uppermost falciger, chaetiger 17. I. Acicula, chaetiger 19. J. Supra-acicular simple chaeta.

tufts antero-laterally, two eyes near base of palps. Three antennae, filiform, with ceratophores. Median antenna (ca. 400 μm long) inserted more posteriorly than lateral ones. Two paired lateral antennae (ca. 250 μm) shorter than median one, inserted near anterior margin of prostomium. Large oval palps. Nuchal organs one pair of ciliated slits between prostomium and tentacular segment. Tentacular segment with two pairs of cirri, filiform, with cirrophores; the dorsal ones (ca. 360 μm) as long as median antenna; the ventral ones shorter (ca. 190 μm).

Parapodia (Figs. 6D, 6E) elongate, uniramous. Dorsal cirri smooth, filiform, with cirrophores, those of chaetiger 1 much longer (720 μm) than antennae and tentacular cirri (Fig. 6A). Dorsal cirri of chaetigers 4, 6, 8, 9, 11, 13, 15 also long (ca. 350 μm , decreasing posteriorly), chaetigers 3, 5, 7, 10, 12, 14 much shorter (ca. 35 μm) (Fig. 6A). Regular alternation of long and short cirri not anterior to

chaetiger 9. Ventral cirri digitiform, arising from the subdistal part of the parapodial lobe, and slightly exceeding its length (Figs. 6D, 6E). One tuft of cilia each dorsal to the bases of the dorsal cirri, and one near the bases of the dorsal cirri, and one near the bases of the ventral cirri. Parapodia with two blunt lobes, between which the chaetae emerge. Acicula (Figs. 6I) distally knobbed. Bundles of chaetae with single supra-acicular simple chaeta, slightly curved, with very minute serrations subdistally on the concave side, and tapering in all parapodia (Fig. 6J). Below the acicula usually three compound falcigers, with short blades (ca. 10 μ m). Uppermost falciger with fine but very dense serrations on the cutting edge and a very small subdistal tooth (Fig. 6H); the two lowermost ones with fewer, but larger and more widely spaced serrations (Figs. 6F, 6G). Distal parts of shafts with spines. Number of chaetae decreasing in the posteriormost parapodia.

Pygidium posteriorly rounded (Fig. 6C). Two paired cirriform anal cirri (length ca. 730 μ m). One pair of ciliary patches postero-laterally on the pygidium near the base of anal cirri.

Foregut situated from anterior margin of chaetiger 1 to the median part of chaetiger 6 (ca. 320 μ m). Proboscideal sheath probably with 10 terminal papillae. Pharynx straight, anterior margin smooth, subdistally with one median dorsal tooth; proventricle (ca. 120 μ m) with ca. 16 rows of muscle cells. Two specimens (34 chaetigers) showing sperm in chaetigers 12 to 30.

Etymology.—The species name refers to its sampling site within a coral reef.

Remarks.—The present species is similar to *Eusyllis heterocirrata* Hartmann-Schröder, 1958, from El Salvador (Hartmann-Schröder, 1959) and *Pionosyllis gesae* Perkins, 1981 from Florida (Perkins, 1981) and the Gulf of Mexico (Uebelacker, 1984). *Eusyllis heterocirrata* (which probably belongs to *Pionosyllis*, Perkins, 1981) has a slightly different alternation of long (on chaetigers 1, 4, 6, 8, 9, 11, 12, 13, 15, 16, 17, 19, 20, 21 . . .) and short dorsal cirri (on chaetigers 3, 5, 7, 10, 14, 18 . . .) and a completely different dark brown color, as a re-examination of paratypes has revealed. *P. gesae* is even closer to the Chinese specimens, but here, too, small but distinct differences exist. The latter differ in possessing one pair of eyes only. The absence of large posterior eyes which are described for some specimens of *P. gesae* (Perkins, 1981: fig. 10A; Uebelacker, 1984: figs. 30–64A) is considered to be a true difference and not a feature that is characteristic for epitokous specimens only. In the present species such eyes are also lacking in two specimens which are sexually mature. Additional differences in the Chinese specimens are the shape of the acicular tip which is knobbed, the spiny structure at the distal part of the shafts in the compound chaetae and a proventricle built up of 14 rows of muscle cells instead of about 23 in *P. gesae*. Additionally, *P. gesae* with 5 mm length and up to 50 chaetigers is considerably larger than the Chinese specimens, which do not exceed 3 mm and have 34 chaetigers only.

Syllides sanyaensis new species

Figure 7A–L

Material Examined.—Six complete specimens from patches of fine coral sand within a coral reef, depth 2–5 m, South China Sea, Hainan Island: near Sanya (18°14'N, 109°30'E), 18 October 1991: locus typicus.

Type Material.—Holotype: complete specimen with 19 chaetigers; deposited in Senckenberg Museum, Frankfurt am Main (SMF 5342), 2 paratypes (SMF 5343); one specimen in the collection of Spezielle Zoologie, Universität Osnabrück; remaining specimens in the collection of First Institute of Oceanography, Qingdao, China (FIOQ 1004).

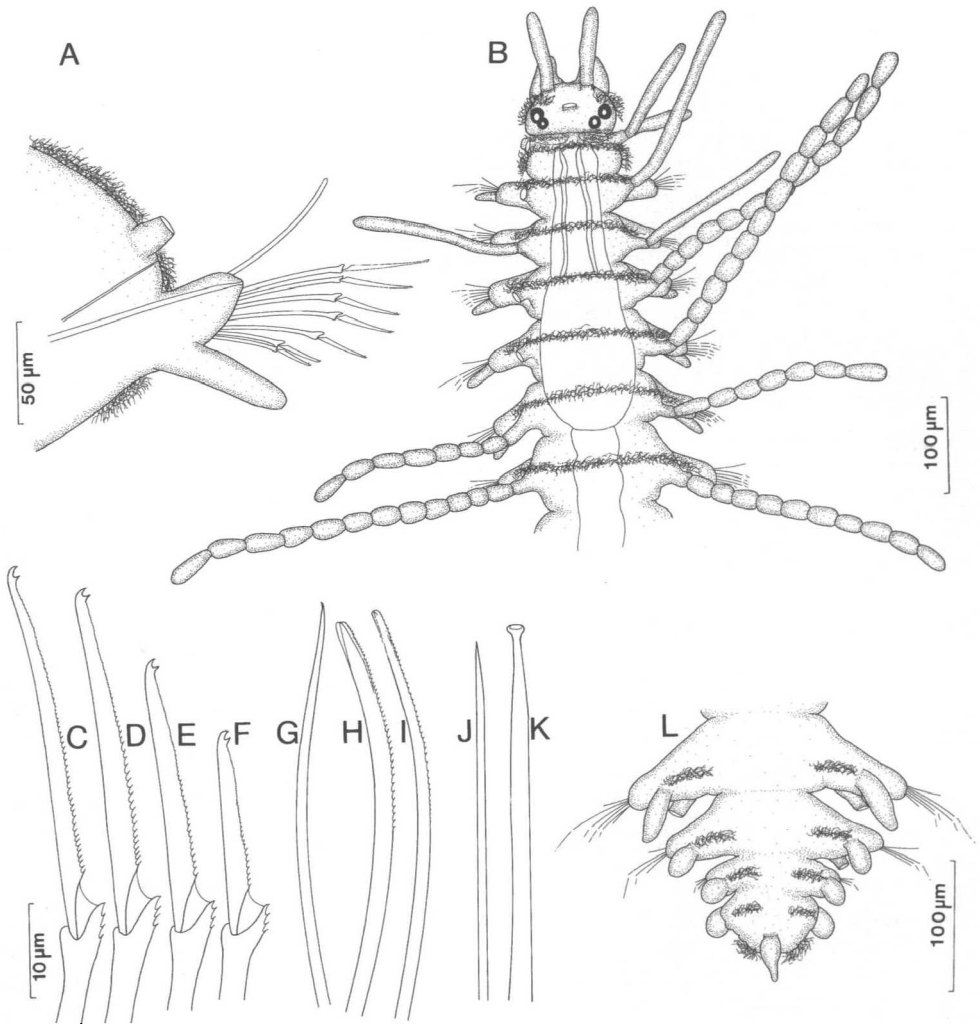


Figure 7. *Syllides sanyaensis* new species. A. Parapodium of chaetiger 24. B. Anterior end, dorsal view. C. Superiormost falciger, chaetiger 6. D, E. Falcigers in the middle of the bundle, chaetiger 6. F. Inferiormost falciger, chaetiger 6. G. Sub-acicular simple chaeta, posterior chaetiger. H. Supra-acicular simple chaeta, chaetiger 6. I. Supra-acicular simple chaeta, posterior chaetiger. J. Noto-acicula, chaetiger 6. K. Neuro-acicula, chaetiger 6. L. Posterior end, dorsal view.

Description.—Almost transparent; extremely fragile. Length between 1 mm (16 chaetigers) and 1.45 mm (21 chaetigers); maximal width 200–250 μm without parapodia, 1 mm including dorsal cirri. Body slender, narrowing anteriorly and posteriorly. Dorsal side convex, ventrally flattened.

Prostomium (Fig. 7B) rounded anteriorly, posterior margin straight cut, two times wider than long. Ciliary tufts laterally and in front of the middle pair of eyes. Three pairs of eyes, anterior ones small, without lenses, near lateral antennae; posterior pairs large, with distinct lenses, in anteriorly open trapezoidal arrangement. Three antennae each with short ceratophores; the median one (lost in all of the six specimens) positioned in the center of the prostomium; paired lateral antennae smooth, slightly club-shaped, longer than prostomium (length ca. 90 μm), inserted near the anterior margin of the prostomium. Palps stretched out

straight forward, conical, widely separated at the base. Tentacular segment nearly as long as prostomium and as following chaetiger. Two pairs of smooth tentacular cirri, slightly club-shaped, with short cirrophores; dorsal pair longer (ca. 130 μm) than ventral one (ca. 100 μm). Paired nuchal organs in form of ciliated slits between prostomium and tentacular segment. With prominent ciliary band dorsally on the tentacular segment as well as on the other segments.

Parapodia uniramous in chaetigers 1 to 5; from chaetiger 6 backwards one thin noto-acicula (Figs. 7A, 7J). Dorsal cirri of the two anteriormost chaetigers smooth and relatively short, the first one slightly longer (ca. 230 μm) than the second one (ca. 220 μm). Dorsal cirri from chaetiger 3 backwards with distinct ovoid articles; longer ones (ca. 450 μm) with about 12 articles; shorter cirri (ca. 260 μm) with about 7 articles. All of the dorsal cirri positioned on distinct cirrophores. Ventral cirri digitiform, arising near the base of the neuropodial lobes, extending slightly beyond the lobes. Dorsal band of cilia in front of dorsal cirri; ciliary tufts also on the ventral side below the ventral cirrus. Neuropodial lobes each with one thick acicula, whose tip conspicuously knobbed (Fig. 7K). One supra-acicular simple bent chaeta (Figs. 7H, 7I), slightly serrated on convex side, present in each parapodium, but distinctly thinner in the posterior segments (Fig. 7I). Sub-acicularly 7 to 11 falcigers; blades bidentate, with minute serrations along the cutting edge; lengths of blades different in one bundle, decreasing from the superior to the inferior chaetae (Figs. 7C–7F); their lengths also differing along the body, longest blades belonging to superiormost falcigers occurring in the median parapodia (ca. 40 μm long), lengths of the blades in anterior and posterior chaetigers shorter (30 μm). Length ratio of blades within a bundle about 3:1 in the anteriormost, about 2:1 in the mid-body and 3:2 in the posteriormost parapodia. About four of the posteriormost chaetigers with one additional simple chaeta in the inferiormost position of the bundle, slightly bent, smooth, tapering (Fig. 7G). Number of chaetae decreasing in the posterior parapodia, last segment achaetous.

Pygidium (Fig. 7L) sub-triangular, with two paired tufts of cilia. Probably three anal cirri, the lateral ones lost in the specimens available, short midventral anal cirrus bottle-shaped (length ca. 40 μm).

Length ratio of pharynx to proventricle about 4:5. Proboscis sheath with about 10 soft distal papillae. Pharynx unarmed. Barrel-shaped proventricle extending from chaetigers 3 to 5, with about 23 larger and 4 smaller rows of muscle cells.

Two specimens with four vitellogenic oocytes per chaetiger from chaetiger 7 backwards; two specimens with sperm from chaetiger 7 backwards.

Etymology.—This species is named for its type locality, a coral reef near the city of Sanya.

Remarks.—According to Banse's (1971) review of the genus, *S. fulvus* (Marion and Bobretzky, 1875) shows the highest similarity to the new species presented. Both species have smooth cirri in the anterior segments and articulated ones in the following segments; they possess compound chaetae with falcigerous blades lacking a large spine or spur (see *S. bansei* Perkins, 1981, and *S. floridanus* Perkins, 1980, which also differ in this character); their shaft endings are identical within the individual bundle and along the entire body, the tip of the superior simple chaeta is evenly rounded. *S. sanyaensis* n.sp. differs from *S. fulvus* in the following characters: (1) the body is half as long with half the number of segments, (2) the palps are separated to the base, (3) the body reveals no color markings, (4) each segment possesses one dorsal ciliary band, (5) the neuro-acicula has a distinctly knobbed tip, (6) the posterior parapodia are equipped with an additional inferior simple chaeta, (7) there is a thin noto-acicula in each of the middle

and the posterior parapodia. However, ciliary bands may be present throughout the genus (Perkins, 1981, Fig. 31e, d), but are usually overlooked; the noto-acicula possibly is an epitokous character restricted to sexually mature individuals (Perkins, 1981: figs. 27f, 29f).

DISCUSSION

Our faunistic studies on the Chinese coast have confirmed what has previously been observed in collections of littoral meiofaunal polychaetes around the world—the astonishingly slight taxonomic distance between geographically widely separated species. Some forms in our sample obviously belong to species with a worldwide distribution (*Petitia amphophthalma*, *Pionosyllis homocirrata*), inasmuch as they exhibit no morphological differences from the specimens collected elsewhere; some of the others are so extremely similar to known taxa that it seems to be a matter of opinion—preference for lumping or splitting—whether they should be assigned a taxonomically separate status.

Recent experience with enzyme electrophoreses or RAPD-PCR techniques in the laboratory of the senior author in the polychaete genera *Nephtys* (Schmidt and Westheide, 1994), *Eulalia* (Bonse et al., 1996) and *Nerilla* (Schmidt and Westheide, in prep.), however, strengthen our general conception that even slight morphological differences speak for separate species. We therefore consider it justified to create a new species when the collected material reveals clear morphological distinctions, slight though they may be.

Including the two recently described *Streptosyllis baolingi* and *S. hainanensis* (Ding and Westheide, 1994), 17 species of the syllid subtaxon Eusyllinae Rioja, 1925 are now known for China (compiled from Wu and He, 1994). Two of the characters regarded as diagnostic of this subfamily are that the palps are fused at their base and that the dorsal cirri are smooth or irregularly wrinkled at most (Hartmann-Schröder, 1971, Fauchald, 1977). These features are considered to distinguish the eusylline generic taxa primarily from those of Syllinae Rioja, 1925, in which the palps have been described as free to the base or absent, and the dorsal cirri as articulated. In fact, it is ever more frequently discovered that many genera originally assigned to one or the other of these two subfamilies include species that exhibit, to a greater or lesser degree, the “characteristics” of the other subfamily. Furthermore, in the case of very small species it is often hard to decide whether palps “contact closely” at the base or are really “fused” at the base. Since these two, now evidently useless criteria were proposed, a number of species have been found to be wrongly classified, and other such errors in the literature presumably still remain to be detected. The present new *Syllides sanyaensis* too, on the basis of its overall habitus, unequivocally belongs in this eusylline genus—even though its palps are free to the base and its dorsal cirri from chaetiger 2 backwards are distinctly articulated. However, to combine the two subfamilies, though presumably the simplest solution of these problems, does not yet seem appropriate; they, like the two other subfamilies Autolytinae and Exogoniinae, are characterized by different types of sexual reproduction and thus are probably monophyletic taxa (San Martín, 1984, Garwood, 1991): the Eusyllinae show epigamous reproduction, whereas the Syllinae reproduce by schizogamy. All that is needed, therefore, is to extend the diagnostic criteria as suggested by Garwood (1991), in order to allow for a broader range of variation particularly in the position of the palps with respect to one another and in the form of the cirri.

The classification of the genus *Psammosyllis* Westheide, 1990 is also not without its problems. Although the completely fused palps would place it in the Exogo-

ninae, the relatively long smooth cirri are unusual for species in this subfamily. Nevertheless, until information is available about reproductive biology that can genuinely clarify their position, *Psammosyllis* should be placed in the Exogoninae.

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